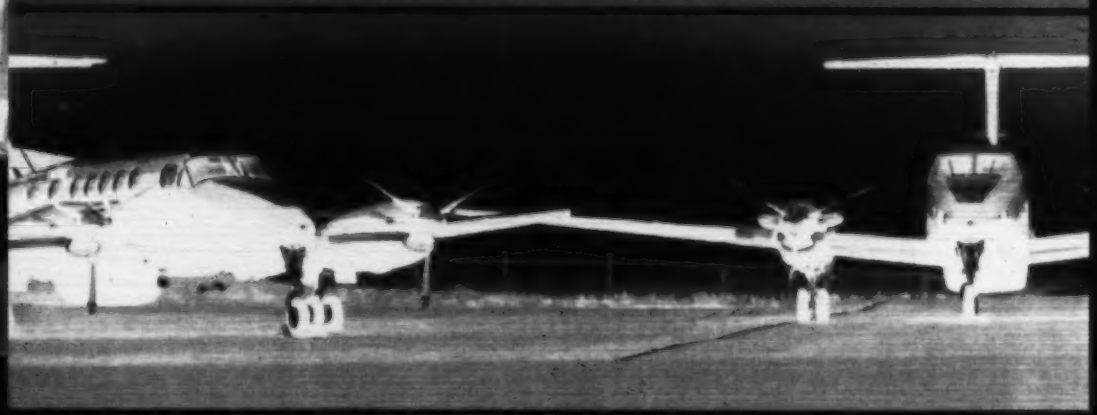
Volume 14, Issue 3

THE AMBASSADOR

Bringing Newfoundland & Labrador to the World



In This Issue...

Read about
Mad Rocks and Smart Bays

Did You Know

A tsunami detection device, recently developed by St. John's-based LewHil Testing Technologies Inc., will be placed in locations throughout the Pacific Ocean for testing.

NRC's Institute for Ocean Technology has one of the world's most advanced basins for testing models of floating structures and ships, while the Institute's Ice Tank is the longest in the world.

Newfoundland and Labrador is home to approximately 45 small and medium-sized enterprises (SME) developing innovative ocean technology products and services.

Canada's most easterly province has a total coastline of 17,542 kms.

Canadian Centre for Marine Communications, CCMC, a St. John's-based, Canadian not-for-profit corporation, recently launched a new international, peer-reviewed quarterly periodical, The Journal of Ocean Technology.
www.journalofoceantechnology.com

Memorial University of Newfoundland is taking a lead role in the high-tech study GeoCod, that will look at how climate change can affect future distributions and levels of fish stocks in the northwest Atlantic Ocean.

Provincial Aerospace does it all

PLANE AND SIMPLE

"Not everyone can take an airplane and transform it. We do design, modification and training and if there's a specific need a client requires, our people find a solution."

That's how Chief Operating Officer and Executive Vice-President Brian Chafe accounts for the success of Provincial Aerospace Ltd. The parent company of the more familiar Provincial Airlines is one of the largest private companies in Newfoundland and Labrador and a leader in maritime surveillance.

Their success goes back to 1989 when the Canadian government retired its fleet of military Tracker aircraft. Other departments that had used the aircraft had to turn to industry for help and Provincial Aerospace stepped in, winning a contract to conduct airborne maritime reconnaissance for the Department of Fisheries and Oceans (DFO). Now Provincial has five fully equipped surveillance Beech King Air 200 aircraft performing missions for various government departments on both the Atlantic and Pacific coasts. The aircraft do a lot of the work traditionally done by the military and their government clients now include DFO, the Department of National Defence, the RCMP, the Coast Guard and Environment Canada. They can do coastal patrols, fisheries surveillance, pollution detection, search and assist, and ice reconnaissance and mapping.

While a government representative participates in the actual mission being undertaken, Provincial Aerospace owns, operates and maintains the assets. It's that complete approach to marine surveillance that is winning them a reputation internationally. Canada isn't the only country hoping to outsource non-military surveillance and the need for such a service has never been perceived as greater.

Provincial Aerospace has just signed a deal worth over $100 million US with the Dutch government to provide air reconnaissance planes to the Netherlands Antilles and Aruba coast guard, replacing the military surveillance aircraft that used to do the job. Equipped with radar, infrared and electrical-optical equipment, day and night photography equipment, communication equipment and Provincial's proprietary data management system, the planes will be used for tracking down environmental, economic and fisheries offenders, intercepting drug transports and saving lives at sea. The planes will be designed, built and operated by Provincial Aerospace.

"We have all the core competencies in one company. We design, modify and train and our operations are conducted in the harshest environment. That forces innovation," says Chafe.

www.provincialaerospace.com

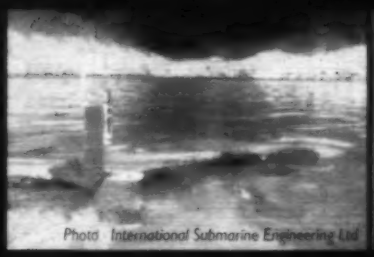


Photo - International Submarine Engineering Ltd

Missions to the Deep...

Newfoundland and Labrador at leading edge of deep ocean research

www.iot-ito.nrc-cnrc.gc.ca
www.ipy.org/development/eoi/details.php?id=698

The 4.5-metre long autonomous underwater vehicle (AUV), MUN Explorer, holds centre stage in a Memorial University of Newfoundland (MUN) lab. The AUV is just one of three of its kind in the world, and is being prepared for its inaugural mission.

While AUVs have been around for a couple of decades, they're going through a growth spurt thanks to researchers at Memorial University and the National Research Council's (NRC) Institute for Ocean Technology in St. John's. Their use as a tool in ocean data acquisition is gaining wider interest as researchers explore new possibilities for the technology. Now, two research teams in Newfoundland and Labrador, each working with the latest generation of two different types of AUVs, are pushing the capabilities of the technology to, well, new depths.

AUVs are relatively small, unmanned, battery or fuel-cell powered submersibles that are preprogrammed and equipped with a payload of scientific instrumentation for various ocean missions. They can reach places that their ROV (remotely operated vehicle) cousins - tethered to a ship on the surface – cannot.

Dr. Neil Bose, Canada Research Chair in Offshore and Underwater Vehicles Design, is excited about the possible areas of research for this new AUV.

"[Explorer] is available for people to load on different instruments to do ocean research," says Bose about the collaborative nature of the project. One such partnership, with the Department of Fisheries and Oceans, will involve mounting an echo-sounder on Explorer to help measure and correlate seabed profiles with fish species.

Bose also has plans to send Explorer on a chilling mission: to dive under the Canadian Arctic ice. "It's a very unusual mission that has a number of challenges," says Bose. "There's no comprehensive mapping or knowledge of what fisheries or biomass populations are there. We want to develop the protocols for operating the vehicle underneath ice. There's an extremely high possibility of new discoveries being made."

Meanwhile across the road, in the lab of NRC research scientists Drs. Chris Williams and Ralf Bachmayer, another AUV is just back from undergoing buoyancy experiments in Conception Bay, NL. While about half the size of the Explorer, the stealthy and efficient glider (it pumps water in and out to change its buoyancy, enabling it to rise and fall through the ocean) can go on far longer missions, up to 30 days.

"Our goal is to expand the application for gliders," says Bachmayer. Interest in using gliders as a cost-effective tool, such as surveying potential aquaculture sites and monitoring marine protected areas, has been expressed by federal and provincial government departments. "We're also helping small companies that see a business opportunity in this ocean technology," says Williams.

"This is hot stuff, it's evolving," he says. "We have a chance to steer it in a direction that we think is interesting and exciting."

Photo - Memorial University of Newfoundland

Beyond the horizon:

Northern Radar's unique surveillance system

St. John's-based Northern Radar, in partnership with Raytheon Canada, offers the only operational high frequency surface wave radar (HFSWR) currently in existence. Now, after years in development, the corporate team is ready to launch their product into hotspots around the world.

How does over-the-horizon surface wave radar (OTH-SWR) differ from conventional radar? Because radio waves tend to travel in straight lines the range of traditional radar, which uses microwave frequencies, is limited by the curvature of the earth. HFSWR, on the other hand, uses low frequencies and produces a strong signal over the ocean. That's because the ocean, being salty, is a highly conductive medium enabling low frequency surface waves to travel long distances over the horizon.

While the principles behind HFSWR radar have been well known for many years, this version of the technology is unique.

A 150 to 300-foot fishing vessel can be spotted up to 225 nautical miles from the coast says Barry Dawe, president of Northern Radar. "There's no other radar system that can see anywhere near that distance from a secure coastal location." In comparison, microwave radars can only see to the horizon, perhaps only 25 miles depending on how high above the land the radar is installed.

Another advantage of this system is its ability to detect low-flying targets.

"Traditional microwave radars are line of sight. You can fly under traditional microwave radars by flying close to the ocean. With surface wave radar, you cannot," says Dawe.

The technology is a surveillance tool primarily of interest to governments. However, it has applicability to oil and other offshore industries. "It can provide a highly accurate map of surface currents," says Dawe. That kind of information would be useful for predicting oil spill movement.

"It's taken 20 years to get here but now it's ready to sail," says Dawe about the technology that was originally developed at C-CORE and Memorial University of Newfoundland. Northern Radar, as recipient of a technology transfer, was established to commercialize the technology.

The partners are working on selling additional systems to Canada's Department of National Defence (two are now operating in Newfoundland and Labrador at Cape Race and Cape Bonavista), and they are close to making some overseas deals.

"We're working closely with Raytheon on international opportunities in Eurasia, Africa, South America," says Dawe, adding that almost any country with a large unprotected coastline, or those that have fishing or other disputes with their immediate neighbours, are potential candidates for the technology.

"There are other countries in the world working on this technology," says Dawe. "But we believe our corporate team has about a two-year lead over everybody right now."

NavSim - typical pilot set-up

Companies' clients

are on the map and on the web

www.navsim.com
www.blueoceans.ca

Safety on land and water is the driving force behind NavSim Technology Inc., a St. John's-based company that uses GPS technology to specialise in software and hardware navigation products.

Bikers, hikers and everyone else who off-road can tell exactly where they are and what they're up against with NavSim's MapCruiser. BoatCruiser will tell you not just where the rocks are, but what other vessels are around you and their course, heading and speed. The program works in every kind of weather, day and night, so it's not surprising that what started out as a tool for the pleasure boat industry is now in demand for commercial vessels. Ultimately the technology can be used to guide unmanned ships doing surveillance or repetitive research data collection, especially in risky areas.

The company's founder, Dr. Piotr Waclawek, attributes NavSim's success to its location.

NavCruiser PRO AIS showing Automatic Identification System (AIS) targets and potential collision Closest Point of Approach

"We are blessed to be on this island," he says. "We are a small company working within a cluster of ocean technology companies. We are well located and we have enough synergy to support each other to become a point on the world map that everyone knows they can come to for ocean technology."

Location also played a strong role in the genesis of Blue Oceans Satellite Systems Inc. When the Department of Fisheries and Oceans (DFO) started requiring black box-like equipment on all fishing vessels for monitoring purposes, Blue Oceans' founder Paul Anderson saw an opportunity to create a device that would fulfill the legal requirements and do more besides. The result was the Voyager M1500, a satellite telephone that not only complies with DFO regulations but also lets you chat with family, check your email and surf the web. Unlike cell phones, satellite phones don't rely on a land-based transmitter so they'll work virtually anywhere.

The success of the Voyager led to the development of the Sky Hawk, a low-power, fully weatherproof satellite modem directed at the commercial/industrial and marine markets. It provides Internet access at remote sites to monitor and control unmanned equipment like oil pumps and data loggers.

"Our standard products meet 90 per cent of the market but we also provide custom development to tailor our products to a client's specific needs," says Anderson.

Blue Oceans was put to the test when the Alberta government asked them to devise a disposable wireless sensor for their grizzly bear tracking system. The initiative was successful and now the time and money saved means that resources can be put into expanding the monitoring program. It's another success story for one of the innovative companies prospering in Newfoundland and Labrador.

Paul Anderson, president Blue Oceans, showing the equipment installed in the back of a H1 Hummer

When is a Bay...

A Smart Bay?

www.smartbay.ca

While the technology is sophisticated and the applications diverse, a new oceans observation system being piloted in Placentia Bay, Newfoundland and Labrador is fundamentally about getting better information in order to make better decisions. No wonder the project – led by St. John's-based Canadian Centre for Marine Communications (CCMC) in partnership with AMEC Earth and Environmental, ICAN Limited and Earth Information Technologies Limited – is called SmartBay.

"Ocean observation is about pulling back real-time data from the ocean and generating information that can help a user of the ocean – a fisher, mariner, marine operator, or an oil spill cleanup person - make a better decision on how they undertake their work or activity," says CCMC's Bill Carter, SmartBay project manager.

The SmartBay system will collect and model a variety of meteorological-oceanographic data. An offshore buoy near the mouth of the bay will contribute to improved and customized weather forecasting by monitoring, among other things, wave height and direction, currents and wind, while two buoys on either side of the bay will generate water quality measurements.

The project will also plug in information from other sources. The Geological Survey of Canada's multi-beam sonar data of the bay's seabed, for example, will provide fishers with a tool to determine optimum fishing areas. Carter is also encouraging the local technology community to use the site to test and profile new technologies. With an improved level of information, ranging from details about shoreside infrastructure to real-time access to weather and sea-state conditions, Carter is hopeful that the SmartBay system will encourage additional industrial activity.

Placentia Bay was chosen as the site for the pilot project due to the growth and diversity of marine activity combined with its sensitive marine ecosystems, and the fact that as early as 1991 the bay was identified as the most likely site in Canada for a major oil spill disaster.

"We're pleased with the degree of endorsement from the community level," says Carter. He says the strength of SmartBay lies in its focus on the user community. All oceans observation data and customized forecasts will be available to users in real time, at no cost, through an accessible web portal and participating mariners will be able to access information from their vessels.

Meanwhile, interest is percolating across the Atlantic and the Marine Institute in Galway, Ireland has expressed interest in modeling a project based on SmartBay. "They want a project like ours and even want the name! They're looking at us as being leaders in how to accomplish something like this," says Carter.

While the pilot will run for about two years, the aim is to expand the project onto the Grand Banks and along the south coast. "The vision is of a northwest Atlantic observatory. This project is a test bed for a much larger area," says Carter.

Mad Rock:

Hooked On Life Boat Safety

www.madrock.ca

As a graduate student working with an offshore safety research team, Dean Pelley spoke to ocean industry representatives to find out what they wanted. He heard the same thing over and over again.

"The industry wanted better evacuation systems. There are huge gaps, especially in hardware. I saw a huge opportunity," Pelley says.

Working with fellow engineering student Jason Dawe, he dug deeper, and soon the pair had filled a four-inch binder with accounts of lifeboat accidents that had resulted in injury and death. A report released in 2001 in the United Kingdom concluded that over the last ten years more people had been killed by lifeboats than had been saved. No wonder people were looking for a better system.

Pelley learned that lifeboat release mechanisms needed improvement. Too often the boats are either released too early or not released after hitting the water. Both scenarios are dangerous, so Pelley and Dawe designed a hook that would release the boat only when it was supposed to be released. Mad Rock Marine Solutions was born to develop the idea and it took a couple of years to get it exactly right.

"We did eight prototypes and fine-tuned it," Pelley says.

Now the device, the RocLoc, is patented in Canada and the United States with patent pending in Europe. More importantly the device has been granted safety certificates by all the major regulators, a necessary step in order to sell the product. In February 2006, Mad Rock got their first sale to retrofit the hooks on lifeboats owned by the Norwegian shipping company, Golar Barber.

"Things are really taking off. We've done some work for Petro-Canada, we've done some work for Transport Canada," says Pelley. "Somebody could come to us tomorrow with an order for 100 hooks."

It's just the first step for the young team. They've got other ideas under development and are looking for major investment in the company. Meanwhile, they are making connections in China and the United Arab Emirates. Mad Rock has obviously found the hook it needs to succeed in international waters.

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The company profiles you read in each issue of The Ambassador newsletter are just the tip of the proverbial iceberg. There's so much more happening in Newfoundland and Labrador, more than we can possibly fit into a newsletter. Simply send your e-mail address to ambassador@gov.nl.ca and we'll be happy to add you to the list for additional information.

Help spread the message!

Thank you for reading this edition of The Ambassador newsletter. We are always looking for ways to reach as many people as possible with the good news about business in Newfoundland and Labrador. If this copy of The Ambassador was mailed to you, please pass it along, or request extra copies so you can help spread the news. If you're reading someone else's copy of the newsletter, contact us and we will put you on our mailing list. See our contact information below.

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This newsletter is a publication of the Ambassador Newfoundland and Labrador Program (ANLP). ANLP is managed and delivered by the Department of Innovation, Trade and Rural Development, Honourable Trevor Taylor, Minister.